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POSTSEASON HUNTING TO REDUCE DEER DAMAGE  
TO DOUGLAS-FIR IN WESTERN OREGON

by

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Abstract

Effects of two successive postseason deer hunts on deer browsing of Douglas-fir seedlings in the Coast Ranges in western Oregon were evaluated. Terminal browsing was significantly lower on the area subjected to more hunting compared with other areas.

Keywords: Browse damage, wildlife management, hunting.

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Browsing by black-tailed deer (Odocoileus hemionus columbianus Richardson) retards height growth of planted Douglas-fir (Pseudotsuga menziesii (Mirb.) Franco) seedlings in many areas of the Coast Ranges in the Pacific Northwest (Black et al. 1979, Crouch 1974). Although browsing is widespread, its adverse impacts to growth of seedlings are usually limited to those areas where terminal shoots of trees are damaged repeatedly over several years. Severe browsing can directly lengthen rotations, cause trees to be overtopped by competing vegetation, or prolong the time that seedlings are highly susceptible to mortality from snowshoe hare (Lepus americanus Erxleben) and mountain beaver (Aplodontia rufa Rafinesque) (Black et al. 1979).

Black-tailed deer thrive in cutover Douglas fir forests (Brown 1961, Taber 1973). Use of clearcuts by deer is high compared with uncut timber, and a positive relationship exists between deer numbers or activity and browsing incidence (Crouch 1974, Hines 1973).

Many methods have been employed to alleviate browsing damage, including repellents (Radwan 1963, Rochelle et al. 1974) and fencing and caging (Campbell and Evans 1975, Crouch manuscript in preparation). Protection of trees by reducing numbers of deer has been tried but not adequately evaluated (Agrons 1965, Hines 1973, Ives 1969).

In western Oregon, hunting to prevent deer damage has been used to protect agricultural and forest crops (Mace 1974); however, monitoring to determine tree response to such programs has been minimal.

In spring 1971, the Siuslaw National Forest and the Oregon State Game Commission (now Oregon Department of Fish and Wildlife) organized a postseason deer hunt to alleviate deer damage on about 45 mi<sup>2</sup> (116.6 km<sup>2</sup>) of forestland near Randall Saddle, about 25 miles (40.2 km) west of Corvallis.

This area was under intensive forest management, and new plantations were being heavily browsed by deer and also being damaged by hare, mountain beaver, and occasionally by elk (Cervus canadensis roosevelti Merriam).

This report evaluates effects of this hunt and a second, somewhat different postseason hunt the following year (1972), on browsing incidence at Randall Saddle, and compares results with those from two nearby areas having different deer hunting regulations.

## Study Areas

Three areas on the Siuslaw National Forest were studied. All were in the Alsea Big Game Management Unit prescribed by the Oregon State Game Commission, and each was subjected to a different hunting regime in the 1st year of the study. The Denzer and Randall Saddle sites were situated west of the Coast Ranges summit, about 15 miles (24.1 km) inland from the ocean. The third site was in the City of Corvallis Watershed, immediately east of the summit.

Prior to the beginning of intensive logging in the late 1950's, all sites were occupied primarily by Douglas-fir about 120 years in age. Through the middle 1960's, blocks ranging in size from 5 to 100 or more acres (2.0 to 40.5 ha) were clearcut, slash was burned, and Douglas-fir seedlings were planted. Clearcuts made later usually ranged from 15 to 40 acres (6.1 to 16.2 ha).

## BROWSING

Terminal browsing incidence is shown in table 2. Initial values representing browsing occurring from April 1970 through April 1971 indicate that the incidence was highest at Randall Saddle, intermediate in the Corvallis Watershed, and lowest on the Denzer blocks. This is the same order that was established in the late 1960's in another study in the same areas (Crouch unpublished (see footnote 2)).

Browsing incidence was not different among years on the Denzer area, where similar hunting season regimes were maintained through the study period. On the Watershed, browsing increased significantly in 1972, following no hunting the previous year, and increased again in 1973 despite hunting in 1972. Browsing incidence declined in 1974, the 3d year after no harvest, to a level comparable to that determined in 1971 (table 2).

At Randall Saddle, browsing declined significantly following the first postseason hunt, and remained at a similar lower level the next year, after the second added season. Browsing incidence was similar to the initial 1971 level in 1974, 2 years after the second postseason hunt.

The reduction in browsing incidence in the years following the postseason hunts at Randall Saddle appear to have resulted primarily from added harvest during the late seasons. It is likely that the attention focused on Randall Saddle through publicizing of the postseason hunts also increased the hunting effort during the general seasons both years.

Table 2--Incidence of terminal shoot browsing on young Douglas-fir under three different hunting regimes in western Oregon

Location	1971	1972	1973	1974
<u>Percent Browsed</u>				
Denzer	34	32	30	31
Corvallis Watershed <sup>1/</sup>	39a	48b	62c	36a
Randall Saddle <sup>1/</sup>	54a	36b	34b	50a

<sup>1/</sup>Within each location, yearly means followed by the same or no letter are not significantly different (P=0.05).

## DATA ANALYSES

Effects of the different hunting regimes on incidence of terminal shoot browsing among years, within locations, were compared by analyses of variance following arcsin transformation of percentage data. Tukey's test was used for mean separations among years.

## Results and Discussion

### DEER HARVEST

Estimated deer harvests during the study are shown in table 1. The values are based mainly on returns from hunter questionnaires assembled by the State management agency from 1971 through 1975. A 30-percent crippling loss was added, and information from check stations supplied the numbers harvested in the postseason hunts at Randall Saddle.

Although no deer population data exist for the study areas, spotlighting and pellet group counts in clearcuts suggested that the general hunting seasons removed only a small proportion of the total number of deer each year, if the published harvest estimates are reasonably accurate.

Harvest data from check stations on the Corvallis Watershed show that more than 10 deer per mi<sup>2</sup> (2.6 km<sup>2</sup>) were taken annually during special hunting seasons between 1957 and 1965.<sup>3</sup> Also, nearly 17 deer per mi<sup>2</sup> (2.6 km<sup>2</sup>) were harvested annually from the nearby McDonald-Dunn Forests from 1958 to 1968 (Hines 1975).

<sup>3</sup>Adapted from unpublished data on file at the Albany office of the Oregon Fish and Wildlife Department.

Table 1--Estimated hunter deer kill on selected areas in the Alsea Big Game Management Unit, Oregon, 1970-74

Location	1970	1971	1972	1973	1974
	<u>Number per mile<sup>2</sup> (2.6 km<sup>2</sup>)<sup>1/</sup></u>				
Denzer	1.2	2.7	3.5	5.5	3.8
Corvallis Watershed	1.2	0.0	3.5	5.5	3.8
Randall Saddle	1.2	5.5	10.5	5.5	3.8

<sup>1/</sup>Adapted from the Oregon State Game Commission Bulletin, 1971-72, and its successor, Oregon Wildlife, 1973-75. Thirty percent crippling losses were added. Randle Saddle values include deer from postseason hunts in 1971 and 1972.



By the late 1960's, sizeable acreages had been clearcut, many of the blocks were poorly stocked, or tree growth was slow, partly because of damage by deer. Although no population data were available, periodic spotlight counts and pellet group inventories showed that deer activity was high in the clearcut blocks, especially at Randall Saddle and in the Corvallis Watershed. Periodic tree examinations indicated that the terminal shoots of large percentages of trees were being browsed each year on these areas (Crouch 1974 and unpublished<sup>2</sup>).

## The Study

Effects of three different hunting regimes were evaluated by semi-annual examinations of marked samples of trees on clearcut blocks in each study area. The effort was originally designed to evaluate only the 1971 hunting season, but a second postseason hunt was added at Randall Saddle in 1972, which prolonged the period of assessment.

Five clearcut blocks ranging in size from 20 to 40 acres (8.1 to 16.2 ha) and in age from 1 to 5 years since logging and planting were selected at each study site. In each block, three samples in plots of 20 trees each were marked and measured in April 1971. Hunting effects on incidence of deer browsing of terminal shoots were determined by examining the same trees in April and September 1971 through 1974.

It was expected that measureable effects of the postseason hunting would be reflected in the years immediately following the added hunting efforts (1972 and 1973) and that effects would be undetectable by 1974, unless the added harvest was unexpectedly large.

### 1971 HUNTING SEASONS

In the Denzer area, hunting followed the regulations for the general deer season common to other Coast Ranges Management Units except that the Alsea Unit was allocated more either-sex permits. A 1-month archery season allowing the taking of one deer of either sex was scheduled before and after the general season (Oct. 2-31), in which the bag limit was one buck deer having at least one forked antler. Also, 3,000 permit-holders were allowed one deer of either sex from October 16 through 31 if they had not taken a buck earlier.

The Corvallis Watershed was closed to hunting in 1971. At Randall Saddle, the hunting seasons were the same as at Denzer except that two additional weekends of postseason hunting were allowed holders of unfilled either-sex permits. The added dates were 1 week and 3 weeks after the general season, respectively. Hunters were checked on and off the Randall Saddle area during the postseason hunts. About 45 mi<sup>2</sup> (116.6 km<sup>2</sup>) were included in the postseason hunts, but only 20 mi<sup>2</sup> (51.8 km<sup>2</sup>) were included in the study.

### 1972 HUNTING SEASONS

Hunting regulations at Denzer were similar to those in 1971 except that 4,000 either-sex permits were issued for the total Alsea Big Game Management Unit. The Corvallis Watershed was open to hunting in 1972 under the same regulations as at Denzer.

Hunting regulations for Randall Saddle were the same as for the other study areas except that two additional postseason weekends of hunting were allowed. For the late hunts, 600 permits were issued each weekend for hunters who were unsuccessful during the general season.

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<sup>2</sup>Unpublished data in the author's files at the Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.

## Conclusions

Results indicate that increasing deer harvests by hunting regulations can reduce browsing by deer, at least on a relatively small, well-roaded area like the Randall Saddle tract. Whether the effort was worthwhile in terms of the protection achieved can only be assessed by long-term monitoring of tree growth.

Justifying, planning, and administering extra-season hunts is laborious and costly; and the efforts offer no assurance that hunter response will fulfill expectations in terms of deer harvest and tree protection.

For success, extra-seasons must be devised that have the best chance to accomplish their protective goals and also assure safe and satisfactory hunting experiences for participants. Such efforts must be properly justified; and their purpose, to protect trees, must be emphasized and publicized well in advance of the proposed seasons.

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